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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/766,295

Filing Date: January 27, 2004

Appellant(s): HORNE ET AL.

Wesley W. Whitmyer Jr.
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed April 1, 2009 appealing from the Office action mailed November 7, 2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,275,152	Krauter et al.	1-1994
6,749,560	Konstorum et al.	6-2004
6,540,669	Abe et al.	4-2003

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-7 and 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,275152 to Krauter et al. in view of U.S. Patent No. 6,749,560 to Konstorum et al. in further view of U.S. Patent No. 6,540,669 to Abe et al.

In regard to claims 1 and 12-13, Krauter et al. disclose an endoscope insertion shaft comprising: a tubular member 21, and a sheath comprising at least the following layers: a braided layer 23 and a wear layer 24, wherein the braided layer jackets the continuous wall of said tubular member; and a barrier layer 22 comprising a polyester wrap is disposed between the continuous wall of said tubular member and the braided layer and jackets the tubular member to form a seal therebetween along the length of the tubular member (see Figs. 2 and 4 and Col. 3, Lines 40-67). Krauter et al. are silent with respect to the tubular member including a continuous wall to form a closed interior and wherein the wall includes at least one aperture for increasing flexibility. Konstorum et al. disclose an analogous endoscope 10 having a shaft 14 comprised of a frame 26 and a cover 32 (see Figure 1). Frame 26 comprises a tube 40 that is preferably formed from a shape memory alloy material, such as Nitinol (see col. 3, lines 10-25). **In regards to claims 2-3 and 6-7,** tube 40 has slots 46 along at least part of its length

where the pattern of slots can be varied and sections of slot patterns are provided, to vary the flexibility of the tube 40 (see col. 3, lines 29-51). The slots 46 provide the tube 40 with increased flexibility along the length of the first section 52 of the tube 40 (see col. 4, lines 1-5). It would have been obvious for one of ordinary skill in the art at the time the invention was made to replace the helical tubular member of Krauter et al. with a continuous wall tubular member to provide an easily manufactured one-piece tube with adequate column strength, flexibility and torque resistance to be inserted into a patient's body as taught by Konstorum et al.

In further regard to claims 1 and 10-11, Krauter et al. teach of an outer most wear layer 24 of polyurethane of sufficient thickness to form an outer skin for the insertion tube body 15 (see Col. 3, Lines 45-49) but are silent with respect to a laminating layer disposed between the wear layer and the braided layer. Abe et al. teach of an analogous endoscope having an outer cover 3 formed into a laminated structure which includes an inner layer 32, intermediate layer 33 and an outer layer 34. In the outer cover 3, one of the inner layer 32, the intermediate layer 33 and the outer layer 34 is made of a material having different physical and chemical properties (referred to collectively as the "material properties") than any one of the other layers. Examples of physical properties include stiffness (flexibility), hardness, elongation percentage, tensile strength, shear strength, flexural elasticity, bending strength and the like, and examples of chemical properties include chemical resistance, weather resistance and the like. Furthermore, the outer cover 3 may alternatively be constructed from just two layers (e.g., the intermediate layer 33 can be omitted, and just the inner

layer 32 and the outer layer 34 can be used) (see Col. 12, Lines 58-64). The inner layer 32 is formed at the innermost peripheral side of the outer cover 3 so as to make contact with the core body 2. Accordingly, the constituent material of the inner layer 32 is preferably chosen to have excellent adhesion with the core body 2 (in particular, the coating layer 231 of the reticular tube 22). Further, the inner layer 32 is preferably formed of a material suited for forming protruding portions 31 having appropriate size (length), shape and number (see Fig. 5 and Col. 10, Lines 44-65). Thus, Abe et al. disclose a laminating layer 32 disposed between the outer layer 34 and the braided layer 22. It would have been obvious for one of ordinary skill in the art at the time the invention was made to include a laminated layer between the wear layer and braided layers in the apparatus of Krauter et al. to control the resilience and durability of the flexible tube as taught by Abe et al.

In regard to claims 4-5, Krauter et al. are silent with respect to wherein the first set of apertures comprises at least one elongated aperture having an axis oriented at an angle to the axis of the tubular member and wherein the angle is in the range from zero to ninety degrees. Figure 3 of Konstorum et al. shows that the slots 46 are positioned along a line parallel to the axis of the tube 40 and have an axis oriented at an angle to the axis of the tubular member, where the angle is in the range from zero to ninety degrees. Figure 3 also shows that the slots 46 are circumferentially positioned on the tube 40. It would have been obvious for one of ordinary skill in the art at the time the invention was made to provide the endoscope of Krauter et al. with various patterns of

apertures in order to vary the flexibility of the tube to a desired stiffness as taught by Konstorum et al.

(10) Response to Argument

Applicant states that Abe et al. fail to disclose a barrier layer between the braided layer and the helical coil. As rejected above, Abe et al. is not relied upon to teach a barrier layer (as Krauter et al. fully disclose the use of a polyester wrap as a barrier layer), but rather is used as a teaching to provide a laminating layer between the wear layer and the braid layer of Krauter et al.

Applicant further states that Abe et al. fail to teach a laminating layer and that the inner layer 32 is incapable of functioning as a laminating layer. Examiner disagrees. Abe et al. teach of an analogous endoscope having an outer cover 3 formed into a laminated structure which includes an inner layer 32, intermediate layer 33 and an outer layer 34. Abe et al. teach that the inner layer 32 is preferably formed of a material that exhibit excellent adhesion with the coating 231 of the braided tube 22 (see Fig. 5 and Col. 11, Lines 1-4). Furthermore, Abe et al. teach that it is desirable to fuse together the coating layer 231 of the braided layer 22 and the outer cover 3, so that the resilience and durability of the flexible material are improved (see Col. 5, Lines 20-35). Therefore, the inner layer 32 of Abe et al. would be fully capable of functioning as a laminating layer which would adhere to the braided layer in the apparatus of Krauter et al. and it would be obvious to one skilled in the art to provide an additional laminating layer in the apparatus of Krauter et al. to help enable a user to control the resilience and durability of the flexible tube (see Col. 10, Lines 60-65).

Additionally, Abe et al. teach that the constituent material of the coating layer 231 is not particularly limited to a specific material. For example, it is possible to use various resins having flexibility such as polyvinyl chloride, polyolefin (e.g., polyethylene, polypropylene, ethylene-vinylacetate copolymer), polyamide, polyester (e.g., polyethylene terephthalate (PET), polybutylene terephthalate), *polyurethane*, polystyrene resin, fluoro-based resin (e.g., polytetrafluoroethylene, ethylene-tetrafluoroethylene copolymer), polyimide, and the like; and one of various elastomers such as polyurethane-based elastomer, polyester-based elastomer, polyolefin-based elastomer, polyamide-based elastomer, silicone rubber, latex rubber, and the like; and blended body, copolymer(including block copolymer) or polymer alloy each having at least one of these materials as a main ingredient (see Col. 6, Lines 23-39). The coating layer 231 of Abe et al. and the barrier layer 22 of Krauter et al. can both be made from similar plastic materials such as urethane (see Col. 3, Lines 43-45 of Krauter et al.). Thus, when the inner layer 32 of Abe et al. is incorporated into the apparatus of Krauter et al. the inner layer 32 will pass through openings in the braided layer and fuse to the urethane barrier layer in the same fashion that the inner layer 32 fuses together with the coating layer 231 as taught by Abe et al. (and as explained by Applicant on pages 6-7 of the Appeal Brief). As a result, a strong bond will be formed between the laminating layer and the barrier layer, and the resilience and durability of the tube will be improved. In fact, the resulting structure would be identical to that of the instant invention as recited in claim 13, wherein "at least the barrier layer, the braided layer and the laminating layer are formed as a single composite structure". The inner layer 32 of Abe

et al. would be strongly bonded (i.e. fused) to the urethane wrap of Krauter, thus forming a single composite structure of the three expressed layers.

As broadly as claimed, the combination of Krauter et al., Konstorum et al. and Abe et al. meet the current limitations of the recited claims.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Matthew J Kasztejna/
Examiner, Art Unit 3739

6/11/09

Conferees:

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